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ABSTRACT

This paper evaluates a program designed to help middle school students develop confidence and skill in decision making regarding their sex roles and achievement goals. Specific purposes of the program (called the Self Concept and Decision Making Middle School Curriculum Program) were to help students experience expanded self-concepts in relation to their identity as females and males, enjoy increased ability and confidence in making decisions for themselves, and exhibit fewer stereotypic attitudes toward particular school subjects. Students were involved in a variety of activities in four subject areas--math, language arts, social studies, and science. Activities, focusing on personal and group decision-making skills, included (1) a social studies unit in which students found out how rules changed over time and how people can choose and define their roles, (2) a language arts unit in which students compared and analyzed female and male language, (3) a unit on collecting and interpreting quantitative data while examining economic and career-related issues about females and males, and (4) a science unit on female and male characteristics from the point of view of genetics and environment. Test scores and attitude inventory results of 630 students who participated in the program were compared with scores of 234 students in control schools. Findings indicated that program participants made achievement gains in the content of the curricular components and acquired more flexible perceptions of occupational, school, and family roles for females and males. The conclusion is that a middle school curriculum program can have a significant effect on pupil's achievement, sex role perceptions, and decision making. (DB)

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CURRICULUM INTERVENTION PROGRAM TO EXPAND MIDDLE SCHOOL PUPILS' SEX ROLE PERCEPTIONS AND DECISION-MAKING

Providing equal treatment for the education of girls and boys is an often stated goal of public schools and mandated by Title IX legislation. Yet evidence indicates that this goal remains elusive. Relative to males, females decline steadily in academic achievement as they grow older (Mullis, 1975), are less likely to earn graduate degrees, and aspire to a more limited number of occupations (Hahn, 1974). Males, too, are often limited in their opportunities for full development. Schools subscribe to traditional socialization practices which encourage boys to develop aggressiveness and competiveness at the expense of expression of a wide range of emotions and the ability to assume caretaking roles (Tibbetts, 1977). As a consequence, students develop a set of attitudes about their roles, and achievement differs for females and males (Scott, 1980a).

Concern for educational equity has produced changes aimed at reducing sex bias in the schools. Title IX requires that schools conduct a self-evaluation of their procedures and take steps to correct unequal treatment. In certain states graduates

of teacher training programs are obligated to complete courses which have a multicultural and nonsexist focus. Publishers have produced new materials which contain a more balanced portrayal of females and males than in prior publications. However, these diffuse efforts have done little to change the achievement patterns and sex role attitudes of students (Katz, 1979).

Other efforts to reduce sex bias have focused on specific intervention programs using special curriculum, supplementary teacher training, or both. In general the sex role perceptions of females are more easily changed than those of males (e.g., Guttentag and Bray, 1976). In addition, preschool and elementary children seem more influenced than those at the secondary level (Guttentag and Bray, 1976). However, few programs have attempted intervention during early adolescence. Because early adolescence is such a critical age for the development of pupils' self-concepts and because many academic decisions which affect pupils' future occupational choices are made at this time, there is a need for specific programs aimed at middle school (or junior high) students.

In addition to providing knowledge about sex stereotypes and exposing students to nontraditional roles for females and males, a curricular program is needed to develop students' confidence and skill in decision-making. Research indicates that both girls and boys lack skills needed to make decisions in a democratic society (Massialas and Hurst, 1978). In order

to overcome their passivity, especially girls, in making choices about their roles and developing their self-worth, students need specific instruction in making and carrying out decisions which can affect their lives and the people around them.

The present research addresses the need for instructional programs which fulfill the following four objectives:

(1) To provide teachers and pupils low cost, easy to use curricular materials that can be infused directly into the middle school curriculum, which typically includes instruction in math, science, language arts, social studies, and physical education.

(2) To increase students' academic achievement by helping them overcome stereotypic attitudes toward particular subject areas (e.g., "It's unfeminine for girls to excel in science.")

(3) To help students expand their self concept in relation to their identity as females or males including role behavior, personality traits, occupational aspirations, and expectations.

(4) To increase students' ability, confidence, and participation in making decisions for themselves.

These needs were addressed as the major goals in the development and validation of the Self Concept and Decision-Making Middle School Curriculum Program funded by the Women's Educational Equity Act Program.

METHOD

Evaluation Design. To determine the effectiveness of this program both formative and summative evaluation procedures were used over a two-year period. During the formative evaluation, five groups of people working with project staff contributed to the development of the program materials: teachers, administrators, consultants, parents, and students. A group of twenty-seven middle school teachers and six administrators assisted project staff in determining the need for these materials, providing feedback on each pilot lesson and field-testing each unit in the classroom. They met with project staff periodically to give additional input into the program development. Consultants to the project reviewed materials and wrote lessons in their areas of expertise. A citizen's review board examined all materials and made recommendations for change. Participating students completed unit pretests and posttests which assessed their mastery of the objectives for each unit. As a result of feedback from these participating personnel, all lessons and texts were revised by the project staff. Each program text was sent to a consultant for final review. (At present the materials are under review for publication by the Education Development Center.)

The summative evaluation during the second year employed a pre- and post-test design to contrast the gain scores of the students participating in the program (experimental group) and those not exposed to the materials (comparison group) for five

dependent measures. In addition, scores on pre- and post-tests for each content area were compared for students participating in the program.

Participants. Six hundred and thirty students in two experimental site schools and 234 students in a comparison school in Tallahassee, Florida, agreed to take part in the program. The experimental schools were selected to reflect two contrasting populations. One site school serves predominantly middle class families and has a population of 80% white and 20% black pupils. The second site school represents a mixture of urban and rural pupils with many low social-economic families and a population of 60% white and 40% black. Students from the comparison school are similar to the second site school in family background and racial composition.

Treatment Program. Student texts and annotated teachers' guides were developed as follows:

Decisions and You - a 12-lesson decision-making core unit in which students learn personal and group decision-making skills (student text and teacher's guide).

Decisions about Roles - a 20-lesson social studies text in which students find out how rules change over time and how people can choose and define their roles (student text and teacher's guide).

Decisions about Language - a 20-lesson language arts text in which students compare and analyze female and male language (student text and teacher's guide).

Decisions about Mathematics - an 18-lesson math text in which students learn how to collect and interpret quantitative data while examining economic and career-related issues about females and males (student text and teacher's guide).

Decisions about Science - an 18-lesson science text in which students examine female and male characteristics and behaviors in relation to genetics and environment (student text and teacher's guide).

Decisions about Physical Activity - a 29-lesson physical education text in which students participate in a physical fitness program designed to improve students' fitness skills and attitudes toward physical activity (teacher's guide).

All students who participated in the program received the unit on decision-making and at least one other content area. Most received a total of at least four units of instruction. During the school year 1979-80 teachers taught the lessons from each subject area either successively during a time period of four to six weeks or interspersed throughout the year at times appropriate for each topic.

Instruments. To measure the impact of the program materials in relation to the program goals, seven different instruments were used. A review of available tests to measure the goals of the program yielded only one appropriate test, so the remaining six were developed specifically for the program. The content validity, or representativeness of the sample items included in

the instruments, and the construct validity, or the extent to which the instruments represented the construct that they purported to measure, were obtained for all instruments developed. A panel of judges (n = 5) reviewed each instrument for content validity and a separate panel (n = 5) reviewed each instrument for construct validity. The feedback from both panels was positive with only editorial type revisions being suggested. Thus, based on technical reviews and expert opinion, the instruments were judged to be valid measures for the evaluation of the project.

(1) Performance Tests. Each of the six texts is accompanied by an achievement test developed using a criterion-referenced approach to measure pupil attainment of the specific objectives for each subject area. Each test was administered to experimental pupils before instruction and again at the completion of each subject area.

(2) Attitute Inventory for Four Subject Areas. Students were asked to express their level of agreement or disagreement on a five-point scale with statements of attitude about the appropriateness of activities for boys and girls relative to achievement in language arts, math, social studies, and science. These attitude inventories were administered to experimental pupils before instruction and at the completion of each text.

The following five measures were administered to all experimental students and comparison pupils before the beginning of the program (fall, 1979) and again at the conclusion of the program (spring, 1980).

(3) Attitudes about Occupational, School, and Family Roles Inventory. This instrument asks students to rate 53 jobs or activities traditionally associated with either females, males, or both on the suitability of participation of females and males. Responses were measured on a five-point scale: only males; mostly males, some females; the same number of males and females; mostly females, some males; and only females (Shaw, Ein, Tremaine, and Kahn, 1977). The purpose of this instrument was to measure changes in pupils' role flexibility in relation to sex stereotypes.

(4) Adolescent Sex Role Inventory (ASRI). Pupils were asked to describe themselves in relation to 60 personality characteristics by responding to a five-point Likert scale. Derived from the Bem Sex Role Inventory, the ASRI uses less difficult vocabulary and was designed for 10-14 year olds by Thomas and Robinson (1979). Reliability and validity measures have also been reported (Thomas and Robinson, 1980). This adjective rating scale of 60 items yields three scores relevant to self-concept: femininity, masculinity, and androgyny. The masculinity score is the mean of the 20 masculine items, the femininity score is the mean of the 20 feminine items, and the androgyny score is the difference between the feminine and

masculine scores. Data reported here are for the androgyny scores.

(5) Occupational Aspirations and Expectations Inventory. For this measure pupils were asked to indicate what occupation they would like to have and what occupation they expect to have when they grow up. Occupational choices were analyzed according to their socio-economic status and the proportion of females or males present in each.

(6) Confidence in Decision-Making Inventory. Students were asked to express their agreement or disagreement on a five-point scale with 20 statements which relate to confidence in making personal decisions at home, at school, and with friends. One item, for example, is "I usually try to do what's right for me, even if my friends disagree." Scores can range from 20 to 100 with a higher score indicating higher confidence in decision-making.

(7) Participation in Decision-Making Inventory. This self-rating instrument assesses students' participation in skills of group decision-making, such as observing, influencing, and organizing. Students respond to each of ten items twice by indicating their degree of participation in the present and degree of participation anticipated in the future on a three-point scale. Scores range from 20 to 60 with the higher score indicating a higher level of participation.
(Copies of all instruments may be obtained from the author.)

RESULTS

Performance Tests. Pupil scores (paired samples) on the pre- and post-tests for each unit were compared using t-tests. For each of the six subject areas (social studies, science, math, language arts, physical education, and decision-making) students made significant gains in the mastery of the content objectives (see Table 1).

Attitude Inventories. A t-test analysis of the pre- and post- attitude inventories yielded significant gains for participants in the four subject areas measured: social studies, science, math, and language arts (see Table 2).

Attitudes about Occupational, School, and Family Roles Inventory. Using the pre-test score as a covariate, a 2 (treatment, experimental versus control) x 2 (sex of student) x 2 (ethnicity, white versus black) analysis of covariance was performed on the post-test. There was a significant difference between the treatment group ($M = 28.41$) and comparison group ($M = 42.45$) (see Table 3), with the lower scores indicating less sex stereotyping. When post-test means were then adjusted to control for pre-test differences in the groups, there still remained a significant difference between the treatment group ($M = 29.87$) and the control group ($M = 38.52$)($t = 4.39$, $p < .01$).

Adolescent Sex Role Inventory (ASRI). The results for the analysis of covariance of the post-test scores using the pre-test as a covariate yielded no main effect for treatment but one for

sex of subject and an interaction effect for treatment group and sex of subject (see Table 4). The cell means adjusted for pre-test differences indicate that in the treatment group girls (M = 100.17) rated themselves significantly more androgynous than did boys (M = 97.27) while there were no significant differences in the comparison group between females (M = 98.92) and males (M = 98.85).

Occupational Aspirations and Expectations Inventory. (Results of this measure are not yet available but may be obtained from the author at a future date.)

Confidence in Decision-Making Inventory. An analysis of covariance indicated a significant effect on the post-test with the treatment group (M = 44.54) showing greater confidence in decision-making than the control group (M = 55.79) (see Table 5). This difference also occurred after adjusting the means to control for pre-test differences between the groups (M = 44.63, 55.55; $t = 12.35$, $p < .01$).

Participation in Decision-Making Inventory. The results of the analysis of covariance show that pupils in the treatment group (M = 29.15) expressed significantly more participation than the control group (M = 32.05) (see Table 6). After adjustments of post-test means were computed to control for pre-test differences, the treatment pupils (M = 29.12) again showed significant more participation than the control group (M = 32.15; $t = 8.66$, $p < .01$).

DISCUSSION

In comparison to previous research, the results of this study yield findings of note in two major ways. First, the effects of the intervention program on sex role perceptions and decision-making were discernible not only in terms of the specific content of each curricular component, but were generalized by participants to their overall sex role perceptions and decision-making attitudes. Second, both girls and boys of middle school ages had more flexible sex role perceptions, although girls made greater shifts in self-concept. Both of these major findings are discussed below.

While numerous curricular materials have been developed which have expanded sex role perceptions, their impact has usually been limited to the specific roles presented in the materials (Scott, 1980b). In this program significant gains occurred not only on the attitude scales for specific subject areas, but also on the general measures of sex role perceptions and decision-making.

Such a large amount of change may be attributed to the content of the teaching materials, extensiveness of the intervention, and/or support for materials by the participating teachers. First, the materials were designed to teach specifically about sex role stereotyping and its influences on people's behavior and the decisions they make. Case studies showing alternatives were presented and discussed. Other curricular materials may be less direct about role stereotyping and only eliminate obvious types of bias. Second, the intervention program included six components

of study, most lasting four to six weeks. It was designed as a total school program and a substantial proportion of students at both site schools participated in a number of units. It is possible there was a spillover effect from such as extensive treatment. Third, although the teachers received no specific training in the content of the curriculum components, they were either paid a small stipend to teach the materials and report their feedback to the program staff or they were expected to participate in a research project as part of their assigned duties. Therefore, they had an incentive beyond their regular teaching responsibilities to become involved with the materials and may have had a greater than average impact on the students in teaching the components.

A second major finding in contrast to previous research (e.g., Guttentag and Bray, 1976) is that on most measures boys as well as girls made significant gains in sex role flexibility and decision-making. Only on the Adolescent Sex Role Inventory did participating boys make significantly fewer gains than girls. This finding may be a result of the design of the curricular materials as well as the intensiveness of the treatment. Most curricular changes to eliminate sex bias have stressed the expansion of female roles (Scott, 1980a; in press). Because of the problems reported in the literature involving boys in expanding their sex role perceptions, these curricular materials were developed to include an emphasis on nontraditional male roles as well as nontraditional female roles.

However, the strength of traditional notions of masculinity may be more powerful than this year-long intervention program in terms of boys' self-concepts, since boys in the program did not show gains on the ASRI. As long as society supports androgynous behavior for females more strongly than for males, it may be difficult for schools to effect change in boys' self concepts in the direction of androgyny.

CONCLUSIONS

The results of this research indicate that a middle school curriculum program can have a significant effect on pupils' achievement, sex role perceptions, and decision-making. In summary, the findings indicate that participants (1) made achievement gains in the content of the curricular components (math, science, language arts, social studies, language arts, physical education, and decision making); (2) acquired more flexible attitudes about the appropriateness of activities for boys and girls relative to their achievement in language arts, math, social studies, and science; (3) gained more flexible perceptions of occupational, school, and family roles for females and males; (4) expressed more androgynous self-concepts (girls, only); (5) gained confidence in decision-making; and (6) expressed more participation in decision making.

Such gains support the adoption by middle school educators of curricular materials described in this paper and others that

may be developed which fuse traditional content already being taught in the middle school curriculum with content about sex role stereotypes.

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TABLE 1

t-Tests of Unit Performance Pre- and Post-tests for Participating Students

Unit	Variable	N of Cases	Mean	Standard Deviation	Table t	Calculated t	Degrees of Freedom	Level of Significance
Decisions and You	Post-test Pre-test	250	21.48 15.68	9.02 6.93	2.33	9.15	249	$p < .01$
Decisions About Roles (Social Studies)	Post-test Pre-test	210	17.45 12.04	4.78 4.35	2.33	17.21	209	$p < .01$
Decisions About Science	Post-test Pre-test	160	19.77 13.46	3.85 4.12	2.33	22.16	159	$p < .01$
Decisions About Mathematics	Post-test Pre-test	291	17.19 12.29	2.97 5.90	2.33	14.91	290	$p < .01$
Decisions About Language	Post-test Pre-test	146	30.49 18.76	7.222 6.09	2.33	18.60	145	$p < .01$
Decisions About Physical Activity	Post-test Pre-test	48	9.42 6.29	6.81 9.13	2.42	4.50	47	$p < .01$

TABLE 2

t-Tests for Pre- and Post- Attitude Inventories

Unit	Variable	N of Cases	Mean	Standard Deviation	Table t	Calculated t	Degrees of Freedom	Level of Significance
Decisions About Roles	Post-test Pre-test	200	43.08 36.40	8.38 8.30	2.33	9.29	199	$p < .01$
Decisions About Science	Post-test Pre-test	149	68.56 46.08	9.51 17.88	2.33	11.99	148	$p < .01$
Decisions About Mathematics	Post-test Pre-test	279	66.77 52.48	9.68 16.69	2.33	12.23	278	$p < .01$
Decisions About Language	Post-test Pre-test	142	30.55 27.76	3.45 4.49	2.33	5.48	141	$p < .01$

TABLE 3

ANCOVA OF ATTITUDES ABOUT OCCUPATIONAL, SCHOOL, AND FAMILY ROLES FOR FEMALES AND MALES

Source of Variation	Sum of Squares	Degrees of Freedom (DF)	Mean Square	F	Signif. of F
Covariates	133445.747	1	1133445.747	250.075	.001
PREROLE	133445.747	1	1133445.747	250.075	.001
Main Effects	13904.763	3	4634.921	8.686	.001
School	12198.094	1	12198.094	22.859	.001
Sex	637.498	1	637.498	1.195	.275
Ethnicity	586.924	1	586.924	1.100	.295
2-Way Interactions	2622.560	3	874.187	1.638	.179
School Sex	878.343	1	878.343	1.646	.200
School Ethnicity	264.255	1	264.255	.495	.482
Sex Ethnicity	1701.355	1	1701.355	3.188	.075
3-Way Interactions	455.026	1	455.026	.853	.356
School Sex Ethnicity	455.026	1	455.026	.853	.356
Explained	150428.096	8	18803.512	35.238	.001
Residual	456246.719	855	533.622		
Total	606674.815	863	702.984		

TABLE 4

ANCOVA OF ADOLESCENT SEX ROLE INVENTORY
FOR TREATMENT AND COMPARISION GROUPS

Source of Variation	Sum of Squares	Degrees of Freedom (DF)	Mean Square	F	Signif. of F
Covariates	5665.498	1	5665.498	270.992	.001
TSORT	5665.498	1	5665.498	270.992	.001
Main Effects	917.053	3	305.684	14.621	.001
School	2.744	1	2.744	.131	.717
Sex	896.346	1	896.346	42.874	.001
Ethnicity	7.065	1	7.065	.338	.561
2-Way Interactions	259.542	3	86.514	4.138	.006
School Sex	241.003	1	241.003	11.528	.001
School Ethnicity	7.205	1	7.205	.345	.557
Sex Ethnicity	18.088	1	18.088	.865	.353
3-Way Interactions	3.490	1	3.490	.167	.683
School Sex Ethnicity	3.490	1	3.490	.167	.683
Explained	6845.582	8	855.698	40.930	.001
Residual	14550.918	696	20.906		
Total	21396.500	704	30.393		

TABLE 5

ANCOVA OF ATTITUDE CONFIDENCE IN DECISION MAKING
FOR TREATMENT AND COMPARISION GROUPS

Source of Variation	Sum of Squares	Degrees of Freedom (DF)	Mean Square	F	Signif. of F
Covariates	3241.960	1	3241.960	24.858	.001
PREATT	3241.960	1	3241.960	24.858	.001
Main Effects	20799.228	3	6933.076	53.159	.001
School	20210.233	1	20210.233	154.961	.001
Sex	118.189	1	118.189	.906	.341
Ethnicity	14.307	1	14.307	.110	.741
2-Way Interactions	1213.809	3	404.603	3.102	.026
School Sex	180.236	1	180.236	1.382	.240
School Ethnicity	207.984	1	207.984	1.595	.207
Sex Ethnicity	875.152	1	875.152	6.710	.010
3-Way Interaction	333.949	1	333.949	2.561	.110
School Sex Ethnicity	333.949	1	333.949	2.561	.110
Explained	25588.946	8	3198.618	24.525	.001
Residual	111510.012	855	130.421		
Total	137098.958	863	158.863		

TABLE 6

ANCOVA OF PARTICIPATION IN DECISION MAKING TEST
FOR TREATMENT AND COMPARISON GROUPS

Source of Variation	Sum of Squares	Degrees of Freedom (DF)	Mean Square	F	Signif. of F
Covariates	179.709	1	179.709	7.484	.006
PREPART	179.709	1	179.709	7.484	.006
Main Effects	1556.664	3	518.888	21.608	.001
School	1536.308	1	1536.308	63.977	.001
Sex	.348	1	.348	.015	.904
Ethnicity	10.788	1	10.788	.449	.503
2-Way Interactions	175.192	3	58.397	2.432	.064
School Sex	73.847	1	73.847	3.075	.080
School Ethnicity	39.159	1	39.159	1.631	.202
Sex Ethnicity	61.965	1	61.965	2.580	.109
3-Way Interactions	5.413	1	5.413	.225	.635
School Sex Ethnicity	5.413	1	5.413	.225	.635
Explained	1916.978	8	239.622	9.979	.001
Residual	20531.393	855	24.013		
Total	22448.370	863	26.012		